

THAT WHICH IS CLAIMED IS:

1. A self-heating battery for delivering its rated capacity when the battery is below a temperature when available battery capacity is limited comprising:

a battery;

a heating element operatively connected to the battery and powered therefrom for heating the battery;

a temperature sensor for determining the temperature of a battery; and

a switch operatively connected to said heating element and temperature sensor and responsive to said temperature sensor for switching on the heating element and raising the temperature of the battery to allow the battery to deliver its rated capacity when a sensed temperature of the battery is below a temperature where available battery capacity is limited.

2. A self-heating battery according to Claim 1, wherein said switch comprises a transistor switch.

3. A self-heating battery according to Claim 1, wherein said switch comprises a field effect transistor.

4. A self-heating battery according to Claim 1, and further comprising a comparator having an output connected to said switch and inputs connected to said temperature sensor for comparing temperature differential and turning the switch on and off and controlling operation of the heating element.

5. A self-heating battery according to Claim 1, and further comprising a load current sensing circuit connected to said heating element for controlling operations of heating element and preventing the battery from discharging when the battery is stored at cold temperatures.

6. A self-heating battery according to Claim 5, wherein said load current sensing circuit comprises a switch operatively connected to said heating element and responsive to load conditions.

7. A self-heating battery according to Claim 6, wherein said load current sensing circuit comprises a load sensing device and a comparator having inputs operatively connected to said load sensing device and an output operatively connected to said switch for controlling operation of said switch and battery heating element based on sensed load conditions.

8. A self-heating battery according to Claim 6, wherein said switch is responsive to load conditions is operative with said switch responsive to said temperature sensing.

9. A self-heating battery according to Claim 6, wherein said switch comprises a transistor.

10. A self-heating battery according to Claim 6, wherein said transistor comprises a field effect transistor.

11. A self-heating battery according to Claim 1, and further comprising a battery discharge circuit connected to said battery for discharging the battery.

12. A self-heating battery according to Claim 11, wherein said battery discharge circuit further comprises a light sensing circuit operatively connected to the battery discharge circuit that actuates the battery discharge circuit after exposing to light the light sensing circuit.

13. A self-heating battery according to Claim 1, and further comprising a charge protection circuit operatively connected to said battery for limiting damage to the battery during charging.

14. A self-heating battery according to Claim 1, and further comprising a flying cell circuit operatively connected to said battery for meeting open circuit and cut-off voltage requirements.

15. A circuit for controlling a battery comprising:

a battery discharge circuit operative with the battery that when actuated, discharges the battery;

a light sensing circuit operatively connected to the battery discharge circuit that actuates the battery discharge circuit after exposing to light the light sensing circuit; and

a battery heater circuit for raising temperature of the battery to allow the battery to deliver its rated capacity when a sensed temperature of the battery is below a temperature where available battery capacity is limited.

16. A circuit according to Claim 15, wherein said battery heater circuit is powered from the battery.

17. A circuit according to Claim 15, wherein said battery heater circuit comprises a heating element, temperature sensor, and a switch connected to the temperature sensor and the heating element and responsive to the temperature sensor for switching the heating element into operation.

18. A circuit according to Claim 17, wherein said switch comprises a transistor operatively connected to said heating element.

19. A circuit according to Claim 18, and further comprising a comparator having an output connected to said transistor and inputs connected to said temperature sensor for comparing temperature differential and turning the transistor on and off and controlling the heating element.

20. A circuit according to Claim 15, and further comprising a load current sensing circuit operable for preventing operation of the battery heater circuit and preventing battery discharge when a battery is stored at cold temperatures.

21. A circuit according to Claim 20, wherein said load current sensing circuit comprises a switch, load sensing device and a comparator having inputs operatively connected to said load sensing device and an output operatively connected to said switch for controlling operation of said switch and battery heater circuit based on sensed load conditions.

22. A circuit according to Claim 15, and further comprising a charge protection circuit for limiting damage to the battery during charging.

23. A circuit according to Claim 1, and further comprising a flying cell circuit for meeting open circuit and cut-off voltage requirements.